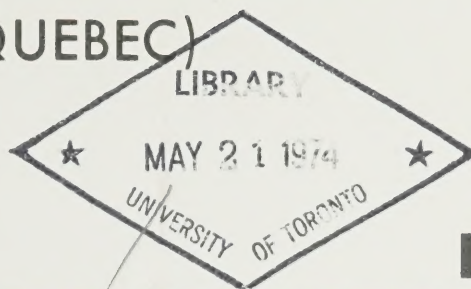


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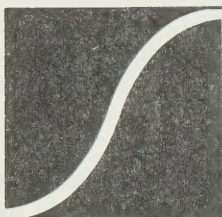
Agriculture
Canada

Canada
Dept of

Economic Branch

General publications

EG-48



a working paper on
**SHEEP PRODUCTION IN THE
EASTERN TOWNSHIPS (QUEBEC)**

A Federal Employment Stimulation Project

Farm Management Division
Agriculture Canada
550 Sherbrooke Street, West
Room 1550
Montréal 111, P.Q.

Economics Branch Publication No. 73/18
December 1973

FOREWORD

We carried out this study of sheep production in the Eastern Townships thanks to the grants awarded us by the Farm Management Division, Economics Branch of Agriculture Canada.

If we divided this study into the following stages: preparation of a questionnaire, sampling of the producers, collection of data, examination of questionnaires, compilation, analysis of data and writing of the report, we may say that the first four stages were carried out under the aegis of the Montreal office of the Farm Management Division (Agriculture Canada) while the last three phases were entrusted to me.

There may be some advantages to such a division of labour but surely there are disadvantages as well. For one thing, it must be realized that whoever is confronted with the analysis of data must verify such data after the survey has been completed without being in any way able to control either their quality or their origin. The same is true of the conventions that must necessarily be established during a survey. Furthermore, it becomes rather difficult to place these data in their real context because the person interpreting the data has not had an opportunity to come into contact with the sheep farms of the Eastern Townships, and also because some results could have been more fully explained if I had been in a position to visualize these farms and hold discussions with some of the breeders.

In spite of these circumstances we have tried to produce the best results possible from this survey and to ensure all the necessary objectivity in the interpretation. Such objectivity may have been assisted to some extent by the way in which the work was organized.

In the part of the work entrusted to me I benefited from the full co-operation of Mr. Jean Claireaux, a technologist in the Rural Economics Department in the Faculty of Agricultural and Food Sciences of Laval University. Mr. Claireaux successfully carried out all the electronic data processing operations connected with this study.

I should like to thank this valuable collaborator and also Agriculture Canada for having given me an opportunity to take part in this study.

Benoît Dumais

July 1973

We carried out this study of sheep production in the Eastern Townships
sheep farms in the province assisted by the Sheep Management Division,
Department of Agriculture Canada.

It was divided into the following stages: preparation of
a questionnaire, sampling of the producers, collection of data, examination
of questionnaire, correlation, analysis of data and writing of the report.
We say that the first four stages were carried out under the aegis of
the Sheep Management Division (Agriculture Canada) while the last stage
was carried out by us.

There may be some advantage in such a division of labour but surely
there are disadvantages as well. The one disadvantage is that the
sheep are confronted with the weight of data that is not only
the sheep has been subjected to but also being in any way able to control
either their position or their weight. The one advantage is that the
data must necessarily be collected under a single, uniform, system,
because after this is done there are no more data to be collected.
The person interpreting the data has not had an opportunity to come into
contact with the sheep or the sheep farmer, and also because
some results could have been anticipated if I had been in a
position to visit the farms and see the sheep and the farmer.

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University of Toronto

In the past of the work carried out as I mentioned from the first
operation of the Sheep Management Division, a questionnaire in the Eastern Townships
Department in the field of Agriculture and Food Science of the
University. Mr. Carleton successfully carried out all the statistical
data processing operations connected with this study.

I should like to thank this valuable collaborator and also Agriculture
Canada for having given me an opportunity to take part in this study.

Benoît J. J. J.

July 1975

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INTRODUCTION

In the summer of 1968 I did a technical and economic study of sheep production in the Gaspé-Lower St. Lawrence Region. The specific objective of this study, which was financed by the Office de Développement de l'Est du Québec, was to measure the economic and technical efficiency of such production and further to make a diagnosis that would make it possible to propose ways of developing such production.

During this initial survey of sheep farming we established a methodology and developed standards and conventions. An entire appropriate working framework was devised that went from the collection of data to their compilation and analysis by a teleprocessing system. The Lower St. Lawrence study achieved its own objectives and produced several publications.

Since that time Agriculture Canada, in co-operation with the project's originator, has carried out similar studies for the three other larger lamb-producing areas in Quebec: Lac Saint-Jean, the Ottawa Valley and the Eastern Townships.

In this report we present the results of the survey made in the Eastern Townships of 34 farms that were entirely or partially devoted to sheep raising. For study purposes these thirty-four farms were divided into two strata: stratum one consists of 22 farms that have from 30 to 60 ewes while stratum two consists of 12 farms with flocks of more than 60 ewes.

As in the earlier studies, sampling, which was necessary to limit the survey work, posed the following problems: there are a great many small flocks of sheep which must be sampled, while there are very few larger flocks (60 or more ewes) which must then be studied completely, without sampling.

The main purpose of this study is to discover the technical and economic efficiency of sheep production in the Eastern Townships. The financial year covered by the survey runs from January 1 to December 31, 1971.

The data were gathered by means of questionnaires filled in by the interviewers themselves during personal interviews with the farmers.

Once the questionnaires were completed, they were consolidated at the Montreal office of the Farm Management Division which then sent them to me for compilation and analysis.

If we may allow ourselves to make a personal comment on the quality of the data, we may say that in general the collection of data was well done and that the basic data are complete and of good quality. At the very most there are a few farms, perhaps four or five, that present some figures that seem abnormal. For example, in one case the investment in buildings seems excessive while in another the number of hours of labour seems unduly high. We can therefore assume that the over-all quality of this study is good and that at the most a few specific criteria may have been distorted by this basic information. However, we shall point these out in passing.

CHAPTER I

FARM STRUCTURE

Although the general objective of the survey is mainly to study the technical and economic efficiency of the sheep farms observed, we should first present some information on the structure of these farms.

The specific purpose of this first chapter is to show the resources used in sheep production. This identification of resources is limited to sheep enterprise as such; that is, to the exclusion even of other crops essential to sheep raising (e.g. feed grain), with the exception of sheep pasture.

Several of the farms surveyed included animal and/or plant production in addition to sheep. That is why we shall often give the relative importance of sheep production, which will enable us better to understand the place sheep production has in the farmer's mind.

1.1 Physical resources

An overall picture of the farm operation should be given so that the reader may judge the relative importance of the resources invested in sheep production.

Looking first at the farm in terms of its physical resources: land, stock, buildings, labour, one sees that in each category the type of resource use will be identified if need be. Once the physical quantification of such resources has been completed, we can look at them now as elements of invested capital, i.e., we can give their monetary value.

1.1.1 Land

The different categories of land are identified according to whether or not the land is cleared to obtain the average total area per farm.

The land can further be divided into four different categories: farms of the TOP group, farms of the INTERMEDIATE group, farms of the BOTTOM groups and finally, the average result for all farms in the stratum.

Table 1 shows the data for stratum I. The major characteristic, noticeable from the start, is the great difference in areas between the various sub-groups. Farms of the top group have an average total area of 258 acres while farms of the bottom group have only 125 acres. The intermediate group contains farms close to the top group, with an average area of 221 acres. Moreover, the overall average for the farms is an area of 210 acres, a figure very close to that for the intermediate farms but which also reveals a wide distribution, comparing this figure with the top and bottom groups.

There is a far greater degree of homogeneity in the cleared area: top group, 93 acres, intermediate group, 85 acres, bottom group, 89 acres, and an average for the stratum of 87 acres. Two conclusions can be drawn from these last data: variations in cleared area from one sub-group to another are so small that they could not possibly be a factor of variation affecting the results. It must also be remembered that the great differences observed in total areas come almost entirely from uncleared areas, which cannot influence the sheep raising results directly but which could be an important factor in use of labour, or more exactly, in smoothing the labour use curve.

Table 2 provides the same data for stratum II. Here is observed a completely opposite phenomenon. The farms of the top group, with 189 acres, are much less extensive than the farms of the bottom group, having an average area of 315 acres. Here it is the intermediate group with largest area per farm, 367 acres. This explains why the average for the stratum is 329 acres, which is higher than for the farms of both the top and the bottom groups.

The same tendency is apparent for cleared areas: 92 acres for the farms of the top group, 157 acres for those of the intermediate group, 141 acres for the farms of the bottom group and 143 for the average.

In general we observe that the size of the cleared area in relation to the total area is much greater in stratum II than in stratum I. These proportions tend to show that the farms of stratum I are more agro-forest whereas agriculture is much more important for stratum II farms.

1.1.2 Sheep pasture

Once we know the composition of the farms as regards cleared and uncleared land, we can observe in each table the use farmers of each stratum make of the cleared land.

One special use with which our study is concerned is the area devoted to sheep pasture. Table 2 shows that the top farms of stratum II devote an average of 48 acres to sheep pasture and the other sub-groups, in order, 20, 32 and 27 acres respectively. The real peculiarity is the considerable difference, from single (20) to double (48), between farms of the intermediate group and those of the top group. Later, an attempt will be made to find out if this difference will have any repercussions in the technical and especially the economic analysis of these various sub-groups of farms.

Table 2 which contains the data for stratum II, shows that the following areas are devoted to sheep pasture: top farms, 53 acres; intermediate farms, 79 acres; bottom farms, 105 acres; and an average

area for the entire stratum of 79 acres. An increase in the area of sheep pasture is noted as you move from the top farms to the bottom farms. This increase is somewhat surprising, however, here absolute data is being dealt with, and it is only in doing the analysis that ratios or co-efficients or measurement can be established that will account for the efficiency or inefficiency of the resources invested in this production.

1.1.3 Stock

The data concerning the stock are supposed to reveal two distinct pieces of information: the absolute size of the sheep stock and its size in relation to the livestock as a whole.

In general, table 1 shows that the farms of stratum I are fairly diversified and that all four animal species are represented on a good number of these farms. The same table also shows that the size of the sheep stock is rather small, 6 to 8 animal units, and that it accounts for hardly more than 25 percent of the livestock of the farms in the different sub-groups.

Table 2 reveals a different position with regard to sheep raising: the top and the bottom farms breed no other type of animal and only the farms of the intermediate group include other species. In stratum II, the number of sheep is higher on average, about 17 animal units. Surprisingly, the farms with the largest numbers of sheep, 30 animal units, belong to the bottom group, while farms of the top group have only 10 and those of the intermediate group have 16.

The proportion of sheep is very different in stratum II from stratum I and it will be important to attempt to find out if this proportion has a marked influence on the qualitative and/or quantitative results of sheep breeding.

1.1.4 Sheep buildings

The sheep barn is another physical resource necessary to sheep speculation. It should be pointed out first that on some farms there are specialized, separate sheep barns, while on others there are areas set aside within multipurpose buildings, for example, section of cow-barn.

Table 1 shows sheep barn areas of 1,762 and 1,757 square feet respectively for farms of the top group and those of the intermediate group, while those of the bottom group have a sheep barn area of 3,528 square feet. At first sight, it seems that the farms of the bottom group make poor use of their premises and that this factor may represent waste. When a technical and economic analysis is done, a stricter judgement can be made.

Table 2, on the other hand, shows far more irregular and surprising areas. The data for the farms of the bottom group in particular may be surprising. However, four or five of the farms of this sub-group have inordinately large buildings and it is impossible to say whether they are intended for future expansion or just occasionally used buildings originally built for other purposes.

1.1.5 Labour

At certain times in the yearly cycle (e.g. lambing, shearing, mating) the demands for labour are fairly large. Such demands for labour vary with the techniques used.

Tables 3 and 4 note the hours worked on average per farm, per sub-group, in each stratum. In both strata the farms of the bottom group expend a disproportionate amount of labour in comparison with the other sub-groups.

The principal factors affecting the intensity of labour are the physical organization of the sheepfold, the size of the flocks, the amount of care given and the way the flock is managed.

1.2 Invested capital

The object of this part of the chapter is to convert resources tied up in sheep production into their monetary value to assess the capital invested in sheep raising and then calculate the profitability and the various financial co-efficients.

Noted regularly in tables 3 and 4 are: initial inventory, final inventory, adjustments in inventory and average inventory, in terms of value, for each of the resources.

1.2.1 Sheep

The sheep were valued on the basis of the scale of values that appears in annex 1 and that was applied in a standard way to each of the sheep farms. Thus, on the basis of the inventory of sheep, recorded by age categories, and of the table of values per head for each of these categories, the value of the inventory as it appears in the first lines of tables 3 and 4 was established.

1.2.2 Investment in sheep barn

Besides the difficulty pointed out in the last section of establishing a definition, there are some additional factors to be considered, with the result that the sheep barn is probably one of the most difficult resources to evaluate. Some of these factors can be identified: the very variable age and condition of such buildings, the way they are fitted out, the primary purpose of the building, etc.

TABLE I - DESCRIPTION OF FARM OPERATIONS - STRATUM I

Number of farms	Sub-groups				Group average
	Top 4/22	Intermediate 14/22	Bottom 4/22		
<u>Land</u>					
Size					
Uncleared area (acres)	165	137	36		124
Cleared area	93	85	89		87
Total area	258	221	125		210
Use of cleared area					
Area in grain	4	9	7		8
Area in hay	83	37	45		47
Area used as sheep pasture	48	20	32		27
Area used for other pasture	32	34	22		31
Other	92	113	20		92
<u>Stock</u>					
Cattle animal units	21	11	21		15
Poultry animal units	8	0	0		2
Sheep animal units	6	6	8		6
Swine animal units	1	8	0		5
Total animal units				29	28
% Sheep A.U./Total A.U.	36	25	59		44
	20	46			
<u>Buildings</u>					
Sheep barn (square feet)	1,762	1,757	3,528		2,080

TABLE 2 - DESCRIPTION OF FARM OPERATIONS. : STRATUM II

Number of farms	Top 2/12	Sub-groups			Group Average
		Intermediate 8/12	Bottom 2/12		
<u>Land</u>					
Size					
Uncleared area (acres)	97	211	175		186
Cleared area	92	157	141		143
Total area	189	367	315		329
<u>Use of cleared area</u>					
Area in grain	9	13	25		14
Area in hay	65	87	35		74
Area used as sheep pasture	53	79	105		79
Area used for other pasture	5	21	0		15
Other	36	168	140		141
<u>Stock</u>					
Cattle animal units	0	54	0		36
Poultry animal units	0	0	0		0
Sheep animal units	10	16	30		17
Swine animal units	0	7	0		5
Total animal units	10	77	30		58
% Sheep A.U./Total A.U.	100	52	100		68
<u>Buildings</u>					
Sheep barn	1,935	3,702	10,738		4,580

In evaluating these buildings, two criteria were closely adhered to their practical value and their replacement value.

Tables 3 and 4 show the average value of sheep barns for each sub-group. There are large variations. However, the above-mentioned factors explain such real differences. These differences will have considerable consequences for the economic results if there are investments that entail heavy costs proportional to the size of the investment and if there is no proportional relationship between the size of an investment and its technical or economic efficiency.

1.2.3 Value of sheep-raising equipment

Tables 3 and 4 show the value of the equipment inventoried displays considerable variation, although relatively small amounts are involved. It is almost necessary to stay at the stage of establishing values for the following reasons: the amounts are relatively small, the variations depend much more on the individual farmers and the techniques they apply, and the amount of equipment probably has more effect on the qualitative than on the quantitative results.

1.2.4 Sheep pasture

The evaluation of sheep pasture somewhat resembles the evaluation of stock, i.e., it is done on the basis of the physical inventory of the number of acres used for sheep pasture. This figure was multiplied by the value per acre of pasture to obtain standardized values for all the farms studied.

Tables 3 and 4 reveal fairly variable values, but they vary with the number of acres used for pasture shown in tables 1 and 2. The scale of values per acre takes into account factors such as: cultivated or natural pasture, rotated or not, the nature and quality of the pasture and the value of the land as such.

1.2.5 Total capital invested

Adding the value of the four preceding resources gives the total of the capital invested in sheep breeding, on average, per farm for each sub-group.

Table 3 shows for both the top group (\$2,794) and the intermediate group (\$3,716), average assets that seem fairly balanced in comparison with each other and with the size of their flocks. The amount shown as the average investment for farms of the bottom group needs to be explained just as much as the previously mentioned exceptional case, which is completely isolated, and which, in addition to distorting the data for this sub-group, has a noticeable effect on the average for the stratum.

In table 4, investments are higher. There is about the same phenomena, including a completely abnormal amount as the average investment for farms in the bottom group.

1.2.6 Conclusion regarding farm structure

This first chapter and the four main tables it includes make it possible to measure and evaluate the resources invested in sheep breeding while indirectly defining the types of farms that will be analysed in later chapters.

The point of view was one of simply noting and measuring, and not analysing and diagnosing. In several instances, these data, in addition to playing a descriptive role, will be the basis for the coefficients that will be established later.

TABLE 3 - CAPITAL INVESTED - STRATUM I

Number of farms	Sub-groups				Group average
	Top 4/22	Intermediate 14/22	Bottom 4/22		
Investments in sheep production					
Sheep					
Initial value	1,064	986	1,194	1,038	
Final value	1,569	1,600	1,979	1,663	
Adjustments	505	614	785	625	
Average value	1,316	1,293	1,586	1,350	
Sheepfold					
Initial value	588	1,399	9,405	2,707	
Final value	558	1,330	8,935	2,572	
Adjustments	-29	-70	-470	-135	
Average value	573	1,364	9,170	2,640	
Equipment					
Initial value	26	52	138	63	
Final value	24	48	124	57	
Adjustments	-2	-5	-13	-6	
Average value	25	50	131	60	
Sheep pasture					
Initial value	880	1,009	2,254	1,212	
Final value	880	1,009	2,254	1,212	
Adjustments	0	0	0	0	
Average value	880	1,009	2,254	1,212	
Totals					
Initial value	2,257	3,446	12,990	5,020	
Final value	3,031	3,985	13,292	5,504	
Adjustments	474	539	301	484	
Average value	2,794	3,716	13,141	5,262	
Labour					
No. of hours devoted to sheep	454	530	1,136	626	

TABLE 4 - CAPITAL INVESTED - STRATUM II

Number of farms	Sub-groups				Group average
	Top 2/12	Intermediate 8/12	Bottom 2/12		
<u>Investments in sheep production</u>					
<u>Sheep</u>					
Initial value	1,778	3,446	6,458		3,670
Final value	2,293	3,891	8,390		4,374
Adjustments	515	445	1,932		704
Average value		2,035	3,669	7,424	4,022
<u>Sheepfold</u>					
Initial value	1,500	3,269	18,500		5,513
Final value	1,425	3,105	17,575		5,237
Adjustments	-75	-163	-925		-276
Average value		1,463	3,187	18,038	5,375
<u>Equipment</u>					
Initial value	71	92	379		136
Final value	64	83	341		123
Adjustments	-7	-9	-37		-13
Average value		68	87	360	130
<u>Sheep pasture</u>					
Initial value	2,160	4,333	8,978		4,745
Final value	2,160	4,333	8,978		4,745
Adjustments	0	0	0		0
Average value		2,160	4,333	8,978	4,745
<u>Totals</u>					
Initial value		5,509	11,140	34,314	14,064
Final value		5,942	11,413	35,283	14,479
Adjustments		433	272	970	415
Average value		5,725	11,276	34,798	14,271
<u>Labour</u>					
No. of hours devoted to sheep	1,209	786		7,126	1,913

CHAPTER 2

TECHNICAL EFFICIENCY

Now that the quantity and the value of the resources invested in the sheep farms studied are known, the technical efficiency achieved by these farms will be measured. In order to do this, a certain number of factor-product relationships must be established that can be expressed through the establishment of technical co-efficients.

Some of these co-efficients can be interpreted in an absolute manner for their value, whereas most of them take their meaning from group analysis by comparing the technical efficiency achieved by each of the sub-groups of each stratum.

The technical co-efficients isolated in the analysis cover the following points: flock management, buildings, feeding, labour and marketing.

Tables 5 and 6 reveal the efficiency of strata I and II. Several of the data that appear there are fairly obvious in themselves; however, it may be useful to make some comments on each of the co-efficients and to bring out the relative position of each stratum and each sub-group.

2.1 Flock size

If flock size is expressed in terms of ewes wintered, in stratum I, farms of the top, middle and bottom groups have sheep flocks of about the same size, give or take a few ewes. On the contrary, in stratum II the flocks of the intermediate group are almost twice as large as the flocks of the top group while they are barely half the size of the flocks of the bottom group.

2.1.1 Lambs born / Ewe with Lamb

This criterion makes it possible to measure the fertility of ewes by reporting the average number of lambs born per ewe, at lambing and without taking into account losses after birth.

This factor is important for it can be stated positively that the number of lambs conditions, at least partly, the level of income from the farm operation since lamb is the main product sold.

Stratum I (table 5) as stratum II (table 6), show that this criterion displays a result that decreases gradually from the top groups to the bottom groups. The top groups show a fertility rate of 1.6 lambs while the bottom groups produce only 1.3 lambs per ewe with lamb.

2.1.2 Lambs surviving / ewe with lamb

Although this criterion depends largely on the preceding, this criterion is far more important because it determines the number of lambs available for sale in addition to giving a very good indication of lamb losses between birth and weaning.

Table 5 shows the following results: for each sub-group 1.33, 1.16, 1.24 and 1.20 lambs surviving per ewe with lamb. The differences between the various sub-groups are not excessive and this is not the criterion that put the farms of the bottom group into last place.

Table 6 gives the same results for stratum II: 1.57, 1.22, 1.18 and 1.27 lambs surviving per ewe with lamb. The decrease in the result corresponds with the rank of each sub-group, i.e., the farms of the bottom group have the lowest co-efficient; furthermore, the top group shows a wider margin of success than the corresponding group in stratum I in comparison with the lower groups and the average for the stratum.

2.1.3 Ewes with lamb / ewe bred

This ratio makes it possible to measure the fertility rate of the flocks. Although this measurement is very important in itself, the results observed are satisfying -- 90 percent or so in most cases, and of the small variation between sub-groups.

Such a fertility rate has been noted in sheep studies conducted in all the different regions of Quebec. Thus, this species does not have any serious problems with sterility, as has often been the case with dairy cattle in the last few years.

2.1.4 Lambs lost between birth and weaning

The rate of lamb losses, which is more or less the difference between the criteria studied in 2.2 and 2.3, is an important factor that reflects the quality of flock management much more than the intrinsic quality of the ewes.

The average rate of loss is higher for stratum I, 18 percent than for stratum II, 11 percent (tables 5 and 6). This index allows the suggestion that farmers with larger flocks can provide better management of their sheep. This finding is entirely normal and has already been made in other studies of this nature carried out in Quebec.

2.1.5 Wool production per ewe

The results here show little variation from one stratum to the other. There is nevertheless a variation of one pound of wool per ewe from one sub-group to the other. Furthermore, another finding with few valid

explanations is that in both strata the number of pounds of wool per ewe increases moving towards the farms of the bottom group and that it is these farms that have above-average production.

2.1.6 Culling rate

The object here is to measure the rate at which farmers rebuild their flocks; as a corollary this co-efficient will enable the determination of the productive life of ewes.

In stratum I (table 5), the culling rate is 16 percent in farms of the top group, 23 percent in those of the middle group and 33 percent in those of the bottom group while the average is 23 percent. Using the average result in interpreting the meaning of this criterion, it can be stated that 23 percent of the ewes are replaced each year or that ewes have an average productive life of a little over four years.

In table 6, stratum II, the following results, in order, were observed: 24 percent, 25 percent, 6 percent and 23 percent. The average rate is exactly the same for each stratum but each sub-group displays rather disparate and abnormal results, since the generally accepted standard is to keep ewes for five or six lambings which would result in a rate of 15 percent to 20 percent.

2.2 Use of sheep barns

The only significant criterion here is the number of square feet per ewe compared with the number of head or animal units. The results (44,51,72,54 and 29,28,47,31 square feet per adult sheep wintered) vary considerably over the eight columns. There are various explanations for this phenomenon: one concerns the very nature of the buildings used, which may have been built for quite a different purpose; this results in badly suited layouts and wasted space. Another explanation for this phenomenon is the marked growth of several flocks; breeders, to ensure that they can increase in size of their flocks, have left themselves room for expansion in their housing areas.

Depending on the interior arrangement, the co-efficient recommended by experts specialists may vary between 20 and 25 square feet per adult sheep.

2.3 Marketing

The following pieces of information can be gathered from this category of data:

- by far the largest number of lambs sold are sold for meat while fairly few are sold as breeding stock;

- the average weight at time of sale, which varies between 45 and 65 pounds, clearly indicates that sheep breeding in the Eastern Townships focuses on the production of light lambs, as opposed to the traditional 90-100--pound heavy lamb.

2.4 Feeding

The cost of feed represents a large share of the cost of maintaining a flock of sheep. Feeding co-efficients measure hay, concentrates and pasturage consumption.

2.4.1 Hay

The generally recommended feeding standard being four pounds of hay per day per adult sheep and the wintering period lasting for about 200 days, there should be co-efficients of the order of 800 pounds of hay per head.

In tables 5 and 6 there are two series of sub-groups:

- some that do not deviate much from the above-mentioned standard. Such is the case, in stratum I, for farms in the top group (984 lb) and farms in the middle group (1,144 lb), and, in stratum II, for farms in the middle (967 lb) and bottom (970 lb) groups;

- two sub-groups, the bottom group in stratum I and the top group in stratum II, show results that deviate astoundingly from the recommended standard.

The differences observed in the first series may be explained, on the one hand, by the quality of the hay which may have been below standard and, on the other hand, by a certain amount of waste that often occurs in sheep barns and the extent of which depends on the type of rack. The differences in the second series remain inexplicable.

2.4.2 Concentrates

The consumption of concentrates per adult sheep, shown in tables 5 and 6, remains within acceptable limits. Hay and concentrate consumption seem to set each other off. It would be expected that farms consuming more hay would use less concentrates; yet, the opposite occurs. This lack of balance will be reflected in increased feed costs for some sub-groups.

2.4.3 Pasture

Pasture constitutes a category of feed where it is very difficult to measure consumption. The intensity, quality and degree of exhaustion vary greatly and are very difficult to quantify. In tables 5 and 6, this consumption is measured in "acres of pasture per sheep animal unit".

Excepting the farms in the top group of stratum I (8 acres/s.a.u.), the farms have four or five acres per sheep animal unit. Such a ratio may seem high, but in many cases, sheep fall into the category of ruminants to which the poorest pastures are assigned.

2.5 Labour

Discussion here will be limited to establishing the relationship between such labour and the size of the flock. The labour co-efficients vary between seven and twenty-eight hours per ewe per year. Other studies in this area have tended to show that an acceptable standard should be in the neighbourhood of or below 10 hours. Under such a standard only one sub-group would have an acceptable result; most of the other sub-groups pose such serious interpretation problems that some doubts can be expressed as to the evaluation of the hours of work that was made when the data were collected.

TABLE 5 - TECHNICAL EFFICIENCY - STRATUM I

Number of farms	Sub-groups				Group average
	Top 4/22	Intermediate 14/22	Bottom 4/22		
The flock					
Ewes wintered	41	36	46		39
Ewes bred	39	34	43		37
Ewes with lamb	36	30	37		32
Lambs born	58	44	50		47
Lambs surviving	48	34	46		38
Lambs sold	32	23	36		27
Lambs born/ewe with lamb	1.60	1.48	1.35		1.48
Lambs surviving/ewe with lamb	1.33	1.16	1.24		1.20
Ewes with lamb/ewes wintered	.88	.83	.79		.83
Ewes with lamb/ewes bred	.91	.88	.84		.88
(Lambs born - lambs surviving/lambs born) x 100	6	21	9		18
(Adults lost/Av. adult) x 100	4	7	8		7
Lb wool produced/head sheared	6	7	8		7
Replacement stock	5	9	10		10
Culling rate	.16	.23	.33		.23

- continued

TABLE 5 - TECHNICAL EFFICIENCY - STRATUM I (concluded)

Number of farms	Top 4/22	Sub-groups		Group Average
		Intermediate 14/22	Bottom 4/22	
<u>Buildings</u>				
Area (square feet)	1,762	1,757	3,528	2,080
Sheep A.U. wintered	6	6	8	6
Square feet/sheep A.U. wintered	297	308	462	334
Square feet/adult wintered	44	51	72	54
<u>Marketing</u>				
No. of market lambs sold	32	22	36	26
No. of breeding stock (fem.) sold	0	2	0	1
No. of reproductive rams sold	0	1	0	0
Average weight/market lamb sold	67	60	61	61
<u>Feeding</u>				
Amount of hay consumed (lb)	40,850	40,443	75,350	46,864
Amount of hay consumed/adult wintered	984	1,144	1,659	1,209
Amount of concentrates consumed (lb)	4,749	7,462	10,708	7,559
Amount of concentrates consumed/adult wintered	133	208	242	201
Amount of concentrates consumed/sheep A.U. wintered	840	1,382	1,541	1,312
Total area sheep pasture/ S.A.U.	8	4	4	5
Total area sheep pasture/adult wintered	1	1	1	1
<u>Labour</u>				
Total hours/year	454	530	1,136	626
Hours/year/ewe wintered	11	16	25	17
Hours/worked during confinement	339	370	670	419
Hours worked in winter/ewe wintered	8	12	15	12
Hours worked during pasture time	116	159	466	207
Hours worked in summer/ewe wintered	3	5	10	5

TABLE 6 - TECHNICAL EFFICIENCY - STRATUM II

Number of farms	Sub-groups			Group Average
	Top 2/12	Intermediate 8/12	Bottom 2/12	
<u>The flock</u>				
Ewes wintered	67	120	210	126
Ewes bred	67	104	210	115
Ewes with lamb	61	95	191	105
Lambs born	101	126	241	141
Lambs surviving	95	109	222	126
Lambs sold	92	81	183	100
Lambs born/ewe with lamb	1.67	1.40	1.27	1.42
Lambs surviving/ewe with lamb	1.57	1.22	1.18	1.27
Ewes with lamb/ewes wintered	.91	.79	.88	.82
Ewes with lamb/ewes bred	.91	.92	.88	.91
(Lambs born - lambs surviving/lambs born) x 100	7	13	6	11
(Adults lost/Av. Adult) x 100	13	5	5	7
Lb wool produced/head sheared	5	7	8	7
Replacement stock	4	21	44	22
Culling rate	.34	.25	.06	.23

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TABLE 6 - TECHNICAL EFFICIENCY - STRATUM II (concluded)

Number of farms	Sub-Groups				Group average
	Top 2/12	Intermediate 8/12	Bottom 2/12		
<u>Buildings</u>					
Area (square feet)	1,935	3,702	10,738		4,580
Sheep A.U. wintered	10	16	30		17
Square feet/sheep A.U. wintered	284	219	370		255
Square feet/adult wintered	29	28	47		31
<u>Marketing</u>					
No. of market lambs sold	92	68	150		85
No. of breeding stock (fem.) sold	0	14	33		14
No. of reproductive rams sold	0	1	1		1
Average weight/market lamb sold	46	49	62		51
<u>Feeding</u>					
Amount of hay consumed (lb)	75,300	121,025	241,300		133,450
Amount of hay consumed/adult wintered	1,102	967	970		990
Amount of concentrates consumed (lb)	10,870	16,412	68,641		24,193
Amount of concentrates consumed/adult wintered	162	135	290		165
Amount of concentrates consumed/sheep A.U. wintered	1,570	1,075	2,226		1,349
Total area sheep pasture/S.A.U.	5	5	4		5
Total area sheep pasture/adult wintered	1	1	1		1
<u>Labour</u>					
Total hours/year	1,209	786	7,126		1,913
Hours/year/ewe wintered	18	7	28		12
Hours worked during confinement	983	634	4,256		1,296
Hours worked in winter/ewe wintered	14	6	17		9
Hours worked during pasture time	226	152	2,730		594
Hours worked in summer/ewe wintered	3	1	10		3

CHAPTER 3

FARM ACCOUNT

Chapter 1 and 2 have dealt with the resources invested and the technical efficiency of resource use. The purpose of this chapter is principally to establish the gross return from sheep production, expenses and remuneration to the farmers.

Since the methodology followed in this section is fairly standard and the terms used are generally known, just a few comments will be made on the results observed at the end of tables 7 and 8. The basic economic diagnosis will be reserved for the chapter that will deal precisely with the analysis of economic efficiency.

3.1 Gross return

The gross return is directly affected by, among other factors, flock size and the percentage of lambs surviving, which determines the number of lambs to be sold.

3.2 Specific expenses

These are expenses directly and exclusively related to sheep, and on the whole, they represent the greater part of total expenses.

3.3 Distributed general expenses

These various expense items cause serious distribution problems because they are common to both sheep and other enterprises. A number of conventions will thus be turned to, explained in the annex, to establish distributions that are as unarbitrary as possible and that are fair enough to each crop considered separately.

3.4 Remuneration for labour and management

Of the over-all results this is probably the most important and the one in which farmers are the most interested for it represents their true wage.

In table 7, stratum I, only the farms of the top group obtain a positive result, that is, only farmers in the top group manage to earn a wage from this production. As for the other two sub-groups, their negative result indicates the absence of any return for the work. The bottom group shows excessive consumption of feed and labour and the weight of this has made itself felt on expenses. Also, the intermediate group had a lower rate of lamb survival. These are probably the most important explanatory factors but they do not make up an exhaustive list explaining such poor results.

In table 8, stratum II, the same phenomenon is apparent, i.e. only farms in the top group obtain positive remuneration. Similar inefficiencies can be identified: heavy feeding with concentrates; excessive sheep-fold areas and unaccounted-for labour for farms of the bottom group; and relatively small gross return for the intermediate group.

TABLE 7 - SHEEP FARM ACCOUNT - STRATUM I

Number of farms	Sub-groups			Group average
	Top 4/22	Intermediate 14/22	Bottom 4/22	
<u>Gross return from sheep production</u>				
<u>Stock sales</u>				
Breeding stock	8	68	0	45
Market lambs	783	491	986	634
Culls	59	68	142	80
Total	849	627	1,127	758
Income in kind from sheep	20	11	19	14
Adjustments	505	614	785	625
<u>Less purchases</u>				
Rams	14	19	46	23
Ewes	99	203	174	179
Ewe-lambs	26	155	603	213
Total	-139	-377	-822	-415
Wool: sales and income in kind	42	41	55	44
Value of manure production	183	161	206	173
Total gross return	1,461	1,077	1,369	1,200
<u>Specific charges</u>				
Feed purchased				
Hay	0	144	44	100
Concentrates	0	27	10	19
Supplements	188	156	396	206
Total	188	327	450	324

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TABLE 7 - SHEEP FARM ACCOUNT - STRATUM I (concluded)

Number of farms	Sub-groups				Group Average
	Top 4/22	Intermediate 14/22	Bottom 4/22		
<u>Specific expenses</u>					
<u>Feed produced</u>					
Hay	410	269	718	376	
Grain	0	46	47	38	
Pasture	213	142	239	173	
Total	623	457	1,004	587	
Total cost of feed	811	784	1,453	911	
Vitamins and minerals	18	13	31	17	
Medecine and veterinary services	22	43	68	44	
Paid labour	10	32	45	31	
Transportation costs + marketing - transportation subsidy	14	25	49	27	
Equipment maintenance and repair	1	2	4	2	
Interest on stock (7%)	92	91	111	95	
Other expenses	0	0	0	0	
Total	157	204	308	215	
Total specific expenses	967	989	1,761	1,125	
Gross margin	493	88	-391	75	
<u>Distributed general expenses</u>					
Sheep barn depreciation	29	70	470	135	
Equipment depreciation	3	5	14	6	
Total	32	75	484	142	
Sheep barn and fence maintenance and repair	35	292	411	267	
Rent for land	0	0	0	0	
Interest on buildings and equipment (7%)	42	99	651	189	
Insurance and property tax	20	33	157	53	
"Estimated" overhead expenses	31	27	34	29	
Total	127	450	1,254	538	
Total general expenses	159	526	1,738	679	
Remuneration for labour and management	335	-437	-2,130	-605	

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TABLE 8 - SHEEP FARM ACCOUNT - STRATUM II

Number of farms	Sub-groups				Group average
	Top 2/12	Intermediate 8/12	Bottom 2/12		
<u>Gross return from sheep production</u>					
Stock sales					
Breeding stock	250	911	1,513		901
Market lambs	2,694	1,562	3,749		2,115
Culls	16	109	0		75
Total	2,960	2,581	5,262		3,091
Income in kind from sheep	40	90	38		73
Adjustments	515	445	1,932		704
Less purchases					
Rams	28	34	250		69
Ewes	688	146	0		212
Ewe-lambs	0	211	1,325		361
Total	-715	-391	-1,575		-642
Wool: sales and income in kind	100	130	433		176
Value of manure production	302	539	943		567
Total gross return	3,201	3,395	7,032		3,969
<u>Specific expenses</u>					
Feed purchased					
Hay	0	129	2,880		566
Concentrates	0	75	1,690		331
Supplements	391	314	609		376
Total	391	517	5,179		1,273

TABLE 8 - SHEEP FARM ACCOUNT - STRATUM II (concluded)

Number of farms	Sub-groups				Group average
	Top 2/12	Intermediate 8/12	Bottom 2/12		
Specific expenses					
Feed produced					
Hay	753	1,071	960		1,000
Grain	34	98	0		71
Pasture	276	492	734		496
Total	1,062	1,661	1,694		1,566
Total cost of feed	1,453	2,178	6,872		2,839
Vitamins and minerals	13	55	172		68
Medicine and veterinary services	97	133	415		174
Paid labour	0	697	4,600		1,231
Transportation costs + marketing					
- transportation subsidy	13	22	54		26
Equipment maintenance and repair	2	3	11		4
Interest on stock (7%)	142	257	520		282
Other expenses	0	0	0		0
Total	267	1,166	5,771		1,784
Total specific expenses	1,720	3,344	12,643		4,623
Gross margin	1,481	51	-5,611		-654
Distributed general expenses					
Sheep barn depreciation	75	163	925		276
Equipment depreciation	7	9	38		14
Total	82	173	963		289
Sheep barn and fence maintenance and repair	38	185	329		185
Rent for land	0	0	0		0
Interest on buildings and equipment (7%)	107	229	1,288		385
Insurance and property tax	49	103	371		138
"Estimated" overhead expenses	50	90	157		95
Total	244	607	2,145		803
Total general expenses	326	779	3,108		1,092
Remuneration for labour and management	1,155	-729	-8,718		-1,746

CHAPTER 4

PRODUCTION COSTS

In this chapter some use will again be made of the expenses shown in the farm account. The main difference is that, in the last chapter, expenses were subtracted from the gross return to determine net income, while here these expenses are added together to find the production cost per flock and per lamb. Thus, these basic data are arranged differently.

4.1 Aggregate cost vs. net cost

Specific and general (divided) expenses are added to determine total production costs and this total is called the aggregate production cost. On the other hand, sheep speculation may generate revenues other than income from lamb sales, for example wool sales. Such income is then subtracted from total production costs to determine what portion of such costs is chargeable to the lambs produced. This portion is here termed "net cost". This procedure is acceptable if agreed that on products other than lambs, there is neither profit nor loss, that is their production cost is equal to their sales value.

4.2 Net cost per lamb

The most sought after result is the "net cost per lamb", for this amount can be compared with the selling price per lamb.

Anticipating tables 11 and 12 a bit, this comparison can be summarized as follows:

	STRATUM I			STRATUM II		
	Top	Intermediate	Bottom	Top	Intermediate	Bottom
Net cost /						
lamb	\$33	\$64	\$109	\$41	\$43	\$107
Average selling						
price / lamb	\$26	\$24	\$ 27	\$29	\$23	\$ 25
Difference	-7	-40	-82	-12	-20	-82

This concise table seems to present gloomy results. It is apparent that, in general, none of these sub-groups can produce at a cost that meets the selling price.

This negative difference does not necessarily mean that there is a cash loss on each lamb sold. The production cost, in addition to actual disbursements, includes charges for the production factors "capital" and "labour", which do not entail actual disbursements, although they ought to be paid for. The production cost also includes charges for depreciation of buildings and equipment.

The net cost per lamb surviving is \$33 and includes about \$15 for labour, \$1 for interest and \$1 for depreciation. Each lamb costs \$18 apart from labour and is sold for \$26, which leaves \$8 instead of \$15. Farmers in this sub-group earn about 75¢ per hour instead of \$1.50, as estimated in the original charge. Such flocks do not lose money for their owners but they do pay them at the rate of only 75¢ per hour instead of \$1.50.

In the sub-groups where the difference is greater, it is possible that there will be no remuneration for labour and, in an extreme case, some sub-groups may suffer a real loss if the difference is larger than the total expenses not actually paid out.

TABLE 9 - SHEEP PRODUCTION COSTS - STRATUM I

Number of farms	Sub-groups				Group average
	Top 4/22	Intermediate 14/22	Bottom 4/22		
<u>Specific expenses</u>					
<u>Feed purchased</u>					
Hay	0	144	44		100
Concentrates	0	27	10		19
Supplements	188	156	396		206
Total	188	327	450		324
<u>Feed produced</u>					
Hay	410	269	718		376
Grain	0	46	47		38
Pasture	213	142	239		173
Total	623	457	1,004		587
Total cost of feed	811	784	1,453		911
<u>Other specific expenses</u>					
Vitamins and minerals	18	13	31		17
Medecine and veterinary services	22	43	68		44
Paid labour	10	32	45		31
Transportation costs + marketing	14	25	49		27
- transportation subsidy	1	2	4		2
Equipment maintenance and repair	92	91	111		95
Interest on stock (7%)					
Total	157	204	308		215
Total specific expenses	967	989	1,761		1,125
Specific expenses/ewe wintered	25	28	40		30
Specific expenses/lamb surviving	22	31	44		32

TABLE 9 - SHEEP PRODUCTION COSTS - STRATUM 1 (concluded)

Number of farms	Sub-groups			Group average
	Top 4/22	Intermediate 14/22	Bottom 4/22	
<u>Distributed general expenses</u>				
Sheep barn depreciation	29	70	470	135
Equipment depreciation	3	5	14	6
Sheep barn and fence maintenance and repair	35	292	411	267
Rent for land	0	0	0	0
Interest on buildings and equipment (7%)	42	99	651	189
Insurance and property tax	20	33	157	53
"Estimated" overhead expenses	31	27	34	29
Estimated value of labour and management (1.50/hr)	681	795	1,703	939
Total	840	1,320	3,441	1,619
Total general expenses	840	1,320	3,441	1,619
General expenses/ewe wintered	20	40	73	42
General expenses/lamb surviving	18	42	74	43
<u>Aggregate expenses</u>				
Aggregate expenses/ewe wintered	1,807	2,309	5,202	2,744
Aggregate expenses/lamb surviving	45	68	113	72
	40	73	118	75
<u>Credits</u>				
	304	282	421	311
<u>Total net cost</u>				
Net cost/ewe wintered	1,503	2,027	4,781	2,432
Net cost/lamb surviving	38	60	104	64
	33	64	109	66

TABLE 10 - SHEEP PRODUCTION COSTS - STRATUM II

Number of farms	Sub-groups				Group average
	Top 2/12	Intermediate 8/12	Bottom 2/12		
<u>Specific expenses</u>					
<u>Feed purchased</u>					
Hay	0	129	2,880	566	
Concentrates	0	75	1,690	331	
Supplements	391	314	609	376	
Total	391	517	5,179	1,273	
<u>Feed produced</u>					
Hay	753	1,071	960	1,000	
Grain	34	98	0	71	
Pasture	276	492	734	496	
Total	1,062	1,661	1,694	1,566	
Total cost of feed	1,453	2,178	6,872	2,839	
Vitamins and minerals	13	55	172	68	
Medicine and veterinary services	97	133	415	174	
Paid labour	0	697	4,600	1,231	
Transportation costs + marketing					
- transportation subsidy	13	22	54	26	
Equipment maintenance and repair	2	3	11	4	
Interest on stock (7%)	142	257	520	282	
Total	267	1,166	5,771	1,784	
Total specific expenses	1,720	3,344	12,643	4,623	
Specific expenses/ewe wintered	26	27	60	32	
Specific expenses/lamb surviving	20	32	58	34	

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TABLE 10 - SHEEP PRODUCTION COSTS - STRATUM (concluded)

Number of farms	Sub-groups				Group average
	Top 2/12	Intermediate 8/12	Bottom 2/12		
Distributed general expenses					
Sheep barn depreciation	75	163	925		276
Equipment depreciation	7	9	38		14
Sheep barn and fence maintenance					
and repair	38	185	329		185
Rent for land	0	0	0		0
Interest on buildings and equipment (7%)	107	229	1,288		385
Insurance and property tax	49	103	371		138
"Estimated" overhead expenses	50	90	157		95
Estimated value of labour and management (1.50/hr)	1,814	1,179	10,688		2,870
Total	2,140	1,958	13,796		3,961
Total general expenses	2,140	1,958	13,796		3,961
General expenses/ewe wintered	32	17	58		26
General expenses/lamb surviving	26	20	55		27
Aggregate expenses	3,860	5,302	26,438		8,585
Aggregate expenses/ewe wintered	57	44	118		59
Aggregate expenses/lamb surviving	46	52	114		61
Credits	458	868	1,413		891
Total net cost	3,402	4,434	25,025		7,694
Net cost/ewe wintered	50	36	112		51
Net cost/lamb surviving	41	43	107		53

CHAPTER 5

ECONOMIC EFFICIENCY

Returning to the method of analysis followed, it is noted that the sheep farms observed were described, then their technical efficiency was evaluated and their income and production costs were measured. In this chapter there will be a kind of synthesis made of all these quantitative data by bringing forward some criteria for measuring economic efficiency, since this is in a way the result of the technical and financial measurements.

5.1 Gross return per ewe wintered

This criterion measures the over-all gross return reduced to the basis of "ewes wintered". In the first stratum, table 11, this criterion declines gradually moving from the farms of the top group to the farms of the bottom group, which indicates that the net income is proportional to the rate of the gross return. Excessive use should not be made of such a rule, for in stratum II, table 12, the bottom group is an exception to this rule and emphasizes that net income can also be affected by the size of the expenses. These farms, which would normally be ranked second on the basis of gross return, are ranked last because the classification criterion is based on net income.

There is another observation regarding the criterion. Flock size has little effect on this measurement since, in both strata, the average gross return is \$33 per ewe. If there is economy of scale, this can be apparent only in the area of expenses.

5.2 Average price per lamb sold

To complete the observations previously made on this subject in 4.2, the average selling price should be indicated to be exactly the same in both strata, \$25. It must also be pointed out that the top groups generally get an above-average selling price, which would be an indication of better quality at time of sale, and consequently of better flock management and the use of good lamb finishing techniques.

5.3 Average price of breeding stock and culls

The disparity in these results reveals that individual situations are being dealt with that, brought into a system of averages, lose their meaning and no longer have any real significance.

5.4 Capital investment in sheep / ewe wintered

The main purpose of this criterion is to measure the degree of capitalization of the farm operations of the different sub-groups.

In general, the entire subject of capital here seems to reveal some bewildering phenomena. Usually the capital investment per ewe is slightly lower in larger flocks. In this study it is stratum I, that of the smaller flocks, that has the smaller capitalization.

In a later chapter, a more definitive judgement can be made regarding the measuring of investment per ewe, according to different flock sizes, different regions, etc.

5.5 Proportion of feed produced in relation to total feed

The extent that sheep production is unnatural is checked here for the Eastern Townships region. With the exception of one sub-group (the bottom sub-group in stratum II, table 12), sheep production derives 70 percent of the necessary feed from the farms where it is established.

Thus sheep production is well suited to the Eastern Townships region, at least from the point of view of food supply.

5.6 Remuneration for labour and management per ewe

Taken into account here are both net income as such and flock size. This measurement is often the criterion farm operators look for when analyzing their operations.

The top group of each stratum shows a positive result. In stratum I, table 11, the flocks of the top group produce \$8 per ewe wintered as remuneration for labour and management.

In stratum II, table 12, the result for the corresponding sub-group is \$17. This means that each ewe, in the top groups, produces \$8 and \$17 respectively as remuneration for labour and management. The number of flocks presenting such results is rather low, but should illustrate the possibilities sheep production can offer. These are real farms, not models, and therefore even the farms in the top groups can be improved.

5.7 Grazing cost per acre

Taking into account the difficulties already mentioned in relation to the evaluation of grazing cost and in line with the methodology described in annex 1, grazing costs have been assessed. In tables 11 and 12 the results vary little from one sub-group to another and even from one stratum to the other, with one exception-grazing represents a cost that varies between \$6 and \$7 per acre grazed by sheep.

TABLE 11 - ECONOMIC EFFICIENCY - STRATUM I

Number of farms	Sub-groups				Group average
	Top 4/22	Intermediate 14/22	Bottom 4/22		
Income per ewe wintered					
Income from stock sales/ewe wintered	21	18	23		20
Income from wool + subsidy/ewe wintered	1	1	1		1
Income in kind + adj. + manure/ewe wintered	18	26	21		24
Less: stock purchases/ewe wintered	4	13	17		12
Gross return/ewe wintered	36	32	29		33
Average price					
Average price of market lambs	26	24	27		25
Average price of breeding ewes	1	8	1		5
Average price of culls	21	12	10		13
Capital investment in sheep/ewe wintered	69	115	269		134
(Feed produced/total feed) x 100	77	61	72		66
Gross margin/ewe wintered	12	4	-11		3
Gross margin/hr of labour	1	0	0		0
Remuneration for labour and management/ewe wintered	8	-11	-46		-14
Remuneration for labour and management/hour	1	-1	-3		-1
Grazing cost/acre of pasture	7	10	7		9
Profit/ewe wintered	-9	-36	-84		-39

TABLE 12 - ECONOMIC EFFICIENCY - STRATUM II

Number of farms	Sub-Groups			Group average
	Top 2/12	Intermediate 8/12	Bottom 2/12	
<u>Income per ewe wintered</u>				
Income from stock sales/ewe wintered	45	23	25	27
Income from wool + subsidy/ewe wintered	1	1	2	1
Income in kind + adj. + manure/ewe wintered	12	9	13	10
Less: stock purchases/ewe wintered	10	3	7	5
Gross return/ewe wintered	48	30	33	33
<u>Average price</u>				
Average price of market lambs	29	23	25	25
Average price of breeding ewes	11	21	23	20
Average price of culls	1	7	1	5
Capital investment in sheep/ewe wintered	86	99	176	110
(Feed produced/total feed) x 100	73	74	23	65
Gross margin/ewe wintered	22	3	-27	1
Gross margin/hr of labour	2	1	-2	0
Remuneration for labour and management/ewe wintered	17	-4	-44	-7
Remuneration for labour and management/hour	1	-1	-3	-1
Grazing cost/acre of pasture	6	7	7	7
Profit/ewe wintered	-9	-14	-86	-25

CHAPTER 6

GENERAL REMARKS

In the last five chapters both data and results are quantitative and concern mainly the production phase. The questionnaires also include some qualitative information, for example, on production and management methods, veterinary care. In addition, the investigators have made some general comments that could be indicative.

From this additional information some useful indicators will be selected for those interested in sheep production.

6.1 Breeds of sheep

The first noticeable characteristic is the presence of a large number of breeds of sheep on the farms studied. There are probably two main explanations for this wide range: one, historical, is the reluctance of Quebec breeders to adopt one breed or another or to make different attempts; the other, technical, would be the encouragement given to the breeding of more or less characterized hybrid stock.

The breeds found on the farms studied are as follows:

EWES		RAMS	
<u>Breed</u>	<u>No. of flocks</u>	<u>Breed</u>	<u>No. of rams</u>
Suffolk	5	Suffolk	15
Hampshire	4	Hampshire	6
Oxford	3	Oxford	2
Dorset	2	Dorset	15
Cheviot	1	Cheviot	3
Leicester	1	Leicester	3
Rambouillet	1	Rambouillet	1
Other (Hybrid)	<u>17</u>	Other (Hybrid)	<u>8</u>
	34		53

Two characteristics are clearly brought out by this table: first, in 50 percent of the flocks the ewes do not seem to belong to any dominant breed; secondly, as far as the rams are concerned, Suffolk and Dorset seem to be becoming the most popular breeds.

6.2 Single, twin, triple and quadruple births

Although this is a fairly secondary characteristic, at least as far as the last two categories are concerned, this is a factor that directly influences the important criterion of the number of lambs per ewe.

The situation may be summarized as follows:

<u>Births</u>	<u>No. of breeders reporting</u>	<u>% of total no. of ewes</u>
Single	33	±60
Twin	34	±39
Triple	16	± 1
Quadruple	1	-

The proportion of single births provides better explanation of the rather poor results in some sub-groups for the criterion "number of lambs born per ewe". Before making a judgement on this point, the proportion of ewes for which this is the first lambing, should be known for very often such ewes have only one lamb. Especially in the larger flocks, it is possible that an accelerated increase in the number of ewes may have produced a fairly high proportion of young ewes.

6.3 Causes of lamb losses

<u>Causes</u>	<u>% of lambs lost</u>
Difficulties at birth	28
Lack of maternal care	22
Respiratory diseases	16
Predators	9
Accidents	7
Weakness	7
Parasites	6
Unknown causes	3
Paralysis	2

Fifty percent of lamb losses, the total for the first two causes, are the result of problems related to flock management and the technical knowledge of the breeders. This finding goes against a wide-spread belief that sheep production is easy. Furthermore, it is an additional argument for providing these breeders with all the necessary technical support if sheep production is to be successful.

6.4 Causes of adult sheep losses

Although the number of adult sheep lost is far lower than the number of lambs, 157 compared to 373, it is interesting to note the causes of adult losses.

<u>Causes</u>	<u>% of adults lost</u>
Predators	38
Difficulties in giving birth	16
Accidents	11
Parasites	11
Weakness and old age	8
Respiratory diseases	7
Unknown causes	6
Paralysis	2
Infections	1

Predators are the most important cause with 38 percent. This is a rather serious problem since this cause is outside the control of the breeders and others concerned with sheep production. This is also probably the only one of the four main sheep-producing areas of Quebec where the effect of predators is so disastrous.

Diseases as such (parasites, respiratory diseases, paralysis and infections) cause about 20 percent of adult losses.

6.5 Pre-breeding conditioning

A technique recommended by many sheep breeding experts, usually called flushing, consists of intensified feeding before the mating period in order to improve fertility. Fifty-nine percent of the breeders applied this technique as part of their flock management while 41 percent did not use it.

6.6 Parasite control

Both external and internal parasites do sheep a great deal of harm. The situation can be summarized as follows:

- 91 percent of breeders surveyed carry out parasite control;
- of this number, 65 percent use powder, 25 percent use sprays and 11 percent use dip;
- 9 percent do not control external parasites;
- of those who do control external parasites, 80 percent do it in the spring and 20 percent in the fall;

- in the case of internal parasites, 97 percent of breeders control them, 88 percent with "thibenzole".

6.7 Age at which ewe-lambs are first bred

The range of ages noted suggests that not a great deal of attention is paid to this factor, even though there may be only four months difference between the extremes:

<u>Age at first breeding</u>	<u>% of breeders</u>
7 months	18
8 months	24
9 months	15
10 months	29
Indefinite	14

6.8 Age at which lambs are weaned

It is recommended that lambs be weaned, both for the development of lambs, which can then receive feeding and for the ewe whose conditioning is modified so that it can then be bred sooner:

- 3 percent of breeders wean at two months;
- 12 percent of breeders wean at three months;
- 18 percent of breeders wean at four months;
- 12 percent of breeders wean at five months;
- 9 percent of breeders wean at six months;
- 46 percent do not wean.

If the sheep production of these farms is focused almost exclusively on light lamb production, it can be said that over 60 percent of breeders do not wean, for the end of these last two periods (five and six months) may correspond to date of sale.

6.9 Pastures

Twenty-four breeders use cultivated pasture for their sheep, 20 use natural pasture, eight use a combination of these two types, and 17 use in addition, as pasture, second-growth hay.

6.10 Shearing

Time of shearing can affect both the quality of the wool and the ewe's behaviour. Of the 34 breeders surveyed, seven do the shearing before the lambing season while 27 do it after the lambing season.

Such results do not allow a judgement to be made for the main factor influencing the choice of this shearing time is probably the type of sheep barn construction and the degree of insulation. The seven breeders who do the shearing before the lambing season do well if their sheep barn is well insulated and if shearing operations are carefully performed, but the other 27 are also right if their sheep barn is not suited for this.

On the subject of means, it should be noted that 100 percent of the breeders do the shearing with electrical equipment.

6.11 Sales channels for lambs and wool

The problems related to lamb marketing are rather complex and sheep production is perhaps the area where marketing is the least structured. It is nevertheless possible to identify the principal sales channels for lamb.

For the 34 farms surveyed, sales are distributed as follows:

- eight producers sell to dealers;
- 13 producers sell at auctions;
- two producers sell to restaurants;
- seven producers sell to butchers;
- four producers sell to individuals;
- of the 34, 27 make occasional sales to individuals.

As for the wool, 65 percent of the producers sell it to the wool producers' co-operative while the others deal with private factories. In 90 percent of the cases, the wool is sold in burlap bags.

6.12 Projected flock sizes

Since flock size at the time of the survey could represent a transition stage, it was attempted to find out what the producers' objectives were by asking them what size flock they were contemplating.

The answers provide the following perspective:

<u>No. of producers</u>	<u>Projected size</u>
1	50-75 ewes
4	100 ewes
3	150 ewes
4	200 ewes
1	250 ewes
6	300 ewes
1	500 ewes
14	status quo

Thus, 20 out of 34 producers have large expansion plans that represent a considerable development of sheep production in this region in comparison with the current situation.

CONCLUSION

This study of sheep production in the Eastern Townships region is the fourth of its kind in Quebec, carried out in as many regions in as many years. The purpose of this report was to give an account of the results of this study and to analyse them. Although it was not useful to incorporate a comparative study of the four studies because such was not the object of the report, this final report should allow such a comparison.

Certain conclusions can be drawn from this study of the sheep farms of the Estrie. It becomes apparent that the resources devoted to sheep production are not always rigorously used and that there is waste in some cases, which often reduces the possibility of earning a profit. Furthermore the technical and economic management often reveal weaknesses that handicap such production. Finally, in the area of technical and economic extension, it seems that these producers do not have all the necessary training and information to cope with sheep production, which has its share of difficulties.

The results for the top groups attest the possibility of an acceptable profitability. Also, the progressive development of flock size will raise sheep production to the level of more specialized commercial farms.

Sheep production thus offers definite and interesting possibilities in this region of Quebec, under conditions of technical and economic efficiency. It should therefore receive all the support necessary for its consolidation, both for the purpose of properly using the human and bio-physical resources of this region and for reducing the growing Quebec lamb deficit.

APPENDIX

DEFINITIONS - STANDARDS

Most of the technical co-efficient terms found in the text do not need explanation. However, it is advisable to define those that seem to be the most important or the most ambiguous.

These terms appear in the order of the different sections studied under the heading of results.

ANIMAL UNITS

Cattle, swine and horse A.U.

The co-efficients used are taken from the publication of Maurice Carel, an agricultural engineer. The publication is entitled "L'observation méthodique" (Methodical observation).

Sheep A.U.

Source: same as for the preceding item.

Rams: 0.12A.U. Ewes: 0.15A.U. Lambs: 0.07A.U.

INVESTMENTS IN SHEEP PRODUCTION

Stock

Stock was evaluated according to a scale that took the age of each unit into account:

	<u>Ewes</u> (dollars)	<u>Rams</u>
1 year	25*	According to an estimate for each farm that varies from \$25 to \$60 with an average of about \$45.
1-2 years	30	
2-3 years	30	
3-4 years	25	
4-5 years	20	
-5 years start	15	
+5 years end	10	

*These are breeding ewe-lambs which either come from the flock or are purchased off the farm.

Sheep barn

The value of the buildings used by sheep is estimated on the basis of their depreciated replacement cost, which in turn is based on the material of which the floor and the walls are composed. This method was developed by Robert Richer, agrologist and agricultural representative for the Sabrevoie Syndicat de Gestion.

<u>Floor</u>	<u>Sides</u>	<u>Replacement cost</u> <u>per square foot (\$)</u>
Cement	Corrugated steel	2.35
Cement	Wood	2.50
Dirt	Corrugated steel	2.10
Dirt	Wood	2.25
Wood	Corrugated steel	2.20
Wood	Wood	2.35

For a cow barn converted into a sheep barn we add a cost of 20¢ per square foot, taking into account the section to be used for crop storage.

Sheep-raising equipment

The equipment is assessed according to its market value at the time of the survey.

Sheep pasture

The value of the area used for sheep pasture was determined for each operation on the basis of an average value of \$60 per acre of cultivated pasture and \$20 per acre of natural pasture. These values are commonly used in the region for management purposes.

LABOUR

The hours of work actually devoted to sheep is an area of concern. The time spent growing feed grains is excluded from these data since sheep production is being considered as an independent speculation.

RATE OF GROWTH

This item is the percentage increase or decrease in the number of ewes at the end of the year compared to the beginning.

AMOUNTS OF CONCENTRATES

This includes the grain, balanced rations and supplements fed to sheep during the year and especially during the winter period.

GROSS RETURN

The gross return consists of the total of stock sales, income in kind from the sheep, adjustments in the flock, wool and the estimated value of the manure. Stock purchases are subtracted from this total.

VALUE OF THE MANURE PRODUCED

Manure is valued at \$4.00/ton according to the standard used in the study of sheep production in the Gaspé and Lower St. Lawrence. Manure production is estimated at 15,000 pounds per 1,000 pounds of live adult sheep. One ewe produces about \$4.50 of manure per year.

SPECIFIC EXPENSES

These are expenses that can be directly applied to sheep production and that have no influence on the farm's other enterprises. Thus, they are linked to the existence of the flock.

FEED PRODUCED

Hay

Hay is valued according to the type and quality of the plants. The average value per ton was set at \$19. However, when the quality is superior to that of mixed hay, the value varies according to the farmer's quality estimate but is never less than \$19.

Grains

Grains were valued at \$2.75 per 100 pounds. This value corresponds to the price generally found and accepted in the region.

PASTURE

There is no ideal method for estimating the expenses to be charged to pasture as a contribution to the feeding of the flock. In this study the figure \$8.36 is used as the cost of maintaining one acre of culti-

vated pasture and \$4.18 for permanent pasture. These data are taken from a study carried out by a group of masters students from the Department of Rural Economics in the Faculty of Agriculture of Laval University.

Since there are wide variations in the number of acres available for sheep pasture, the equivalent of half an acre per ewe should be charged maximum as the contribution made by pasture to feeding. Where efficiency is greater than 0.5 in terms of acres per adult, the actual result is used. A second entry under expenses linked to the cost of pasture is the interest on the value of the land. This rate is set at 7 percent. The cost of pasture corresponds to the number of adults being pastured multiplied by the number of acres per adult, not exceeding 0.5 acre/adult, and the whole is then multiplied by \$8.36 or \$4.18, depending on the type of pasture. The interest charge is added to this.

MAINTENANCE AND REPAIR OF EQUIPMENT

This item is estimated at 3 percent of the starting value of the inventory.

GROSS MARGIN

The gross margin is the difference between the gross return and the specific expenses. In theory the result per ewe should be relatively constant for each unit added to or subtracted from the basic flock.

GENERAL EXPENSES

These are expenses that are separate from the flock and that affect the farm as a whole.

Depreciation of the sheep barn

The depreciation rate was set at 5 percent of the value of the sheep barn at the beginning of the financial year. The method used is "the constant rate on a decreasing balance". Using the straight line method, this rate would be $2\frac{1}{2}$ percent.

Depreciation of equipment

The rate is 10 percent of the value at the beginning of the financial year and the method is identical to that in the preceding item.

Insurance and property taxes

Property taxes were established following a survey of the municipalities. On the basis of the averages obtained, the capital investment in land is taxed at 60 percent of its value with a rate of \$2.25 per one hundred dollars. On the other hand, since the amounts of insurance were available from the survey, the distribution criterion was the percent s.a.u/t.a.u.

Estimated overhead expenses

This item includes expenses for electricity, telephone and contributions. In view of the difficulty of distributing these expenses properly in relation to the farm's other speculations, some calculations were done. They were based on some data made available in the questionnaires, which showed a tendency for them to be in the neighbourhood of 75¢ per ewe wintered. This is the rate used.

LABOUR AND MANAGEMENT INCOME

This is the difference between the gross margin and the distributed general expenses. This result is similar to the idea of net operating income.

Estimated value of labour and management

A rate of \$1.50 per hour of labour is used as it is considered to be a minimum remuneration for agriculture. This rate is applied to the number of hours of labour from which the hours of paid labour have been deducted, since the cost of paid labour is included in specific expenses.

Profit of loss

It is very important that it be clearly understood that this item does not correspond to a monetary profit or loss. It means the ability of sheep speculation to meet all its expenses (specific, general, labour and management), both real and imputed.

Credits

This item is used in the calculation of production costs. It consists of those elements of income that do not come directly from lamb sales. Credits include the sale of cost stock income in kind, wool sales and manure production.

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